

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-ENV-20
Building Envelope Sealing		(Page 1 of 1)
Site Address:	Enforcement Agency:	Permit Number:

BUILDING ENVELOPE SEALING

Diagnostic Testing Results			
<i>CFM50_H = the measured airflow in cubic feet per minute (cfm) at 50 pascals for the dwelling with air distribution registers unsealed. SLA = 3.819 x (CFM50_H / Conditioned Floor Area in ft²) per Residential ACM Manual Equation R3-16</i>			
	Building Envelope Leakage CFM50 _H as measured using a blower door diagnostic device	✓	✓
1.	Enter the blower door leakage target CFM50_H value for compliance from the CF-1R (cfm).		
2.	Enter the blower door leakage minimum CFM50_H value corresponding to 1.5 SLA from the CF-1R (cfm).		
3.	Enter the measured CFM50_H value from the blower door test (cfm)		
4.	The leakage test passes if the measured envelope leakage CFM50 _H value from row 3 is less than or equal to the value required for compliance from row 1, otherwise the test fails. check/enter Pass or Fail	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail
5.	If measured CFM50 _H from row 3 is less than the minimum CFM50 _H value corresponding to 1.5 SLA from row 2: check/enter < 1.5 SLA, otherwise check/enter ≥ 1.5 SLA	<input type="checkbox"/> < 1.5 SLA*	<input type="checkbox"/> ≥ 1.5 SLA
<p>*Advisory note to builder and enforcement agency: If row 5 indicates "< 1.5 SLA", it is critical to ensure that combustion and solid-fuel burning appliances in the dwelling are provided with adequate combustion and ventilation air and vented in accordance with manufacturers' installation instructions and all applicable codes as specified by ASHRAE Standard 62.2 Section 6.4. Additional information about compliance with this requirement is given in Section 4.6.5 of the Residential Compliance Manual under the topic of Combustion and Solid-Fuel Burning Appliances.</p>			

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-ENV-21
Quality Insulation Installation (QII) - Framing Stage Checklist		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

1. Quality Insulation Installation (QII) - Framing Stage Checklist

*Air barrier and preparation for insulation verification inspection must be done at framing stage before insulation is installed. If there are any "No" answers rows not filled out or signatures missing then this is not valid form and cannot be accepted by the building department or HERS rater. If spray foam is used an air barrier is not required NA would be checked. QII credit not allowed if any steel framing or structural framing in the walls of a **conditioned** space.*

✓ FLOOR AIR BARRIER			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All gaps in the raised floor to unconditioned space or to outside larger than 1/8" filled with foam or caulk. (NA if SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All openings on a second floor including under a tub where the drain penetrates the floor is sealed
Yes	No	NA	
✓ WALLS AIR BARRIER			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All gaps in wall exterior sheathing to unconditioned space or to outside larger than 1/8" filled with foam or caulk. (NA if SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	No gaps in sheathing against the garage, attic, or covered patio. All gaps larger than 1/8" filled with foam or caulk. (NA if SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All gaps in Rim-joists in interior and exterior walls to the outside including holes drilled for electrical and plumbing larger than 1/8" filled with foam or caulk. (NA if SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rope caulk, foam gasket, or caulking bead around the entire sole plate of the home
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All gaps around the windows are caulked or foamed (stuffing with fiberglass not acceptable)
Yes	No	NA	
✓ ATTIC INSPECTION			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Attic rulers appropriate to the material installed evenly throughout the attic to verify depth. (NA if SPF or batt)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Square foot of attic ____ / 250 = ____ minimum number of rulers installed. Must round up.
Yes	No	NA	Number of rulers actually installed ____ (NA if SPF or batt)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ALL rulers visible from attic access. (NA if SPF or batt)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Eave vents baffles installed at all eave vents to prevent air movement under or into insulation. (NA if SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Area of eave vent baffle is the same or larger than the net free-ventilation area of the eave vent. (NA if SPF)
Yes	No	NA	
✓ CEILING AIR BARRIER			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All draft stops in place to form a continuous ceiling air barrier no gaps larger than 1/8". (NA if SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All drops covered with hard covers. Gaps around or in the hard cover larger than 1/8" filled with foam or caulk. (NA if SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All recessed light fixtures in non conditioned space IC and air tight (AT)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All recessed light fixtures are sealed with a gasket or caulk between the housing and the ceiling
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Openings around flue shafts fully sealed with solid blocking or flashing and any remaining gaps sealed with fire-rated caulk or sealant.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Piping shafts openings fully sealed and caulked
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Penetrations from wiring in interior walls, electrical boxes, fire alarms etc. sealed with caulk or sealant
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All duct chases, fireplace chases, and double walls sealed air tight at the ceiling level.
Yes	No	NA	All gaps into shafts larger than 1/8" filled with foam or caulk. Special attention paid to ducts entering shafts from ceiling.

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-ENV-21
Quality Insulation Installation (QII) - Framing Stage Checklist		(Page 2 of 2)
Site Address:	Enforcement Agency:	Permit Number:

✓ GARAGE ROOF/CEILING AIR BARRIER FOR TWO STORIES (no conditioned space over garage)			
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	Air barrier installed at joists in garage to house transition (between floors). No gaps larger than 1/8". If SPF used then air barrier installed gaps not required to be filled. (NA if SPF or conditioned space over garage)
✓ GARAGE ROOF/CEILING AIR BARRIER FOR TWO STORIES (conditioned space over garage)			
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	If insulation is to be installed at subfloor then subfloor has no gaps over 1/8". Air barrier installed at joists in garage to house transition (between floors). (NA if SPF or no conditioned space over garage)
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	If insulation is to be installed at ceiling of garage then ceiling and joists to the outside have no gaps over 1/8". (NA if SPF or no conditioned space over garage.)

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Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-ENV-22
Quality Insulation Installation (QII) - Insulation Stage Checklist		(Page 1 of 3)
Site Address:	Enforcement Agency:	Permit Number:

*QII credit not allowed if any steel framing or structural framing in the walls of a **conditioned** space.*

Insulation Stage Checklist

FLOOR INSULATION			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All floor joist cavity insulation installed to uniformly fit the cavity side-to-side and end-to-end. (NA if floors slab on grade).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation in full contact with the subfloor, NO gaps. (NA if floors are slab on grade).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation in contact with air barrier on all five sides. (ends, sides, back). NA if floors are slab on grade.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Batts cut to fit around wiring and plumbing, or split (delaminated). (NA if loose fill, SPF, or slab on grade).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Batt insulation has continuous support. (NA if loose fill, SPF, or slab on grade).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation R-value same or greater that listed on CF-1R.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF insulation properly adhered to avoid gaps and provide an air seal
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF (Spray Polyurethane Foam Medium Density) insulation the average thickness is equal to or greater than that listed on the CF-1R and the minimum thickness shall be no more than 1/2 inch less than the required thickness for the R-value. (NA for other forms of insulation).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF list the required floor cavity R-value from CF-1R, R-____. List tested average depth of insulation____ in X 5.8R = ____ R this is the installed R-value and must be equal to or greater than listed on CF-1R (NA for other forms of insulation)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Measure thickness of insulation in 6 random measurements. Must be within 1/2 inch of the required depth.
Yes	No	NA	

✓ WALL INSULATION			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Standard depth cavities insulation fills cavity and touches air barrier on all six sides. (NA if SPF used and meets the required R-value).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All double walls and bump-outs, the insulation fills the cavity or additional air barrier installed so that the insulation fills the cavity. Insulation touches all six sides. (NA if SPF used and meets the required R-value).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Behind tub/shower, walls under stairs, and fireplace, insulation touches air barrier on five sides. Not required to fill the space. Cavity required to be air tight.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BATTS , not a single void/depression deeper than 3/4" in ANY stud bay. (NA if loose fill or SPF)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BATTS , voids/depressions less than 3/4" allowed as long as the area is not greater than 10% of the surface area for each stud bay. (NA if loose fill or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loose Fill no gaps or voids of any depth allowed. (NA if batts or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Any gaps between studs or insulation larger than 1/8" must be filled with insulation or foam.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All Rim-joists to the outside insulated.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Special attention must be paid to corner channels, wall intersections, and behind tub/shower enclosures insulated to proper R-Value.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All skylight shafts and attic kneewalls insulated with minimum R-19.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation in full contact with drywall or wall finish of skylight shafts and attic kneewalls.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wall insulation same or better than what is listed on the CF-1R.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF insulation properly adhered to avoid gaps and provide an air seal
Yes	No	NA	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-ENV-22
Quality Insulation Installation (QII) - Insulation Stage Checklist		(Page 2 of 3)
Site Address:	Enforcement Agency:	Permit Number:

Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF (Spray Polyurethane Foam Medium Density) insulation the average thickness is equal to or greater than that listed on the CF-1R and the minimum thickness shall be no more than 1/2 inch less than the required thickness for the R-value. (NA for other forms of insulation).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF list the required floor cavity R-value from CF-1R, R-____. List tested average depth of insulation ____ in X 5.8R = ____ R this is the installed R-value and must be equal to or greater than listed on CF-1R (NA for other forms of insulation)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Measure thickness of insulation in 6 random measurements. Must be within 1/2 inch of the required depth
Yes	No	NA	
✓ CEILING INSULATION			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BATTS there must not be a single gap/void/depression deeper than 3/4". (NA if loose fill or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BATTS voids/depressions less than 3/4" allowed as long as the area is not greater than 10% of the surface area for each stud bay. (NA if loose fill or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NO gaps or voids allowed for loose fill and SPF. (NA if batts).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	All ceiling insulation installed to uniformly fit the cavity side-to-side and end-to-end.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation in full contact with the ceiling, NO gaps.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation in contact with air barrier on all five sides.
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Batts cut to fit around wiring and plumbing, or split (delaminated). (NA for loose fill or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Batts taller than the trusses must expand so that they touch each other over the trusses. (NA for loose fill or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SPF the average thickness is equal to or greater than that listed on the CF-1R and the minimum thickness shall be no more than 1/2 inch less than the required thickness for the R-value. (NA if loose fill or batts).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Insulation fully fills cavity below any plywood platform or cat-walk. If SPF used then minimum 3 inches. (NA if no platforms or cat-walks)
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Attic access gasketed
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Attic access insulated with rigid foam or batt insulation using adhesive or mechanical fastener. R-value same as ceiling R-value listed on CF-1R
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Recessed light fixtures covered full depth with insulation. If SPF used then other forms of insulation used to cover or enclosed in a box fabricated from 1/2-inch plywood, 18 ga. sheet metal, 1/4-inch hard board or drywall
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wall insulation same or better than what is listed on the CF-1R
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loose Fill Insulation at proper depth – insulation rulers visible and indicating proper depth and R-value for blown in insulation. (NA for batts or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loose Fill Insulation uniformly covers the entire ceiling (or roof) area from outside of all exterior walls. (NA for batts or SPF).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Loose-fill mineral fiber insulation meets or exceeds manufacturer's minimum weight and thickness requirement for the target R-value. Target R-value _____ Manufacturer's minimum required weight for the target R-value _____ (pounds-per-square foot). Sample weight _____ (pounds per square foot).
Yes	No	NA	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Manufacturer's minimum required thickness at time of installation _____ (inches) Manufacturer's minimum required settled thickness _____ (inches). Number of days since loose-fill insulation was installed _____ (days). At the time of installation, the insulation shall be greater than or equal to the manufacturer's minimum initial insulation thickness. If the HERS rater does not verify the insulation at the time of installation, and if the loose-fill insulation has been in place less than seven days the thickness shall be greater than the manufacturer's minimum required thickness at the time of installation less 1/2 inch to account for settling. If the insulation has been in place for seven days or longer the insulation thickness shall be greater than
Yes	No	NA	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-ENV-22
Quality Insulation Installation (QII) - Insulation Stage Checklist		(Page 3 of 3)
Site Address:	Enforcement Agency:	Permit Number:

			or equal to the manufacturer's minimum required settled thickness. Minimum thickness measured (inches).
✓ GARAGE ROOF/CEILING INSULATION FOR TWO STORIES(no conditioned space over garage)			
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	Insulation installed at joists against the air barrier in the garage to house transition (between floors). All wall insulation requirements above must be met. (NA if no conditioned space over garage).
✓ GARAGE ROOF/CEILING INSULATION FOR TWO STORIES(conditioned space over garage)			
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	If insulation is to be installed at subfloor then the insulation must also be installed at joists against the air barrier in the garage to house transition (between floors). All ceiling and wall insulation requirements above must be met. (NA if no conditioned space over garage).
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	If insulation is to be installed at ceiling of garage then the joists to the outside must be insulated and all the insulation requirements listed above must be met. (NA if no conditioned space over garage).
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	SPF insulation properly adhered to avoid gaps and provide an air seal
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	SPF (Spray Polyurethane Foam Medium Density) insulation the average thickness is equal to or greater than that listed on the CF-1R and the minimum thickness shall be no more than 1/2 inch less than the required thickness for the R-value. (NA for other forms of insulation).
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	SPF list the required floor cavity R-value from CF-1R, R-____. List tested average depth of insulation ____ in X 5.8R = ____ R this is the installed R-value and must be equal to or greater than listed on CF-1R (NA for other forms of insulation)
<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	Measure thickness of insulation in 6 random measurements. Must be within 1/2 inch of the required depth

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HERS Rater Information		
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Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-20
Duct Leakage Test – Completely New or Replacement Duct System		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Enter the Duct System Name or Identification/Tag:
Enter the Duct System Location or Area Served:
<i>Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.</i>

This certificate is required for compliance for completely new duct systems installed in new dwelling construction, and also for completely new or replacement duct systems in existing dwellings. For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed.

Duct Leakage Diagnostic Test – completely new or replacement duct system	
Enter a value for the Allowed Leakage (CFM) for the duct system leakage verification. The value entered must be the Verified Low Leakage Ducts in Conditioned Space criteria or one of the three calculated leakage rates described below.	
Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Compliance Credit. If compliance credit for verified low leakage ducts in conditioned space is shown in the special features section of the CF-1R, the leakage to outside test method must be used to verify duct leakage (refer to RA3.1.4.3.4), and 25 CFM must be entered for Allowed Leakage.	Allowed Leakage (CFM)
Allowed leakage calculation – (select one calculation method from this section). Use 6% (<i>leakage factor</i> = 0.06) for calculations. When utilizing Low Leakage Air Handler (LLAH) credit, the allowed duct leakage may be specified by the CF-1R to be less than 6%, in which case the user-specified leakage rate must be used in the calculations below. For example, if the user-specified leakage (specified as a percentage of fan airflow) is reported on the CF-1R as 3%, then use a <i>leakage factor</i> of 0.03 in the calculations below.	
<input type="checkbox"/> Cooling system method: Nominal capacity of condenser in Tons _____ x 400 x <i>leakage factor</i> = _____ (CFM)	
<input type="checkbox"/> Heating system method: 21.7 x _____ Output Capacity in Thousands of Btu/hr x <i>leakage factor</i> = _____ (CFM)	
<input type="checkbox"/> Measured airflow method (RA3.3): Enter measured fan flow in CFM here _____ x <i>leakage factor</i> = _____ (CFM)	
Enter value for Actual leakage (CFM) in the right column, from measurement using applicable duct leakage pressurization test procedure from Reference Residential Appendix RA3.1(CFM @ 25 Pa).	Actual Leakage (CFM)
List Actual Leakage from duct leakage test (CFM)	
Pass if Actual Leakage is less than Allowed Leakage <input type="checkbox"/> Pass <input type="checkbox"/> Fail	
For complete replacement of duct systems only, if the 6 percent leakage rate criteria cannot be met, a smoke test should be performed to verify that the excess leakage is coming only from a pre-existing furnace cabinet (air handler cabinet), and not from other <i>accessible</i> portions of the duct system. A HERS rater must verify the installation (No sampling allowed).	
List Actual Leakage from smoke test(CFM)	
Pass if all accessible leaks (except for existing air handler) are sealed using smoke <input type="checkbox"/> Pass <input type="checkbox"/> Fail	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-20
Duct Leakage Test – Completely New or Replacement Duct System		(Page 2 of 2)
Site Address:	Enforcement Agency:	Permit Number:

- ☐ Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.
- ☐ All supply and return register boots must be sealed to the drywall
- ☐ New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.
- ☐ Mastic and draw bands must be used in combination with Cloth backed, rubber adhesive duct tape to seal leaks at duct connections.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-21
Duct Leakage Test – Existing Duct System		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Enter the Duct System Name or Identification/Tag:
Enter the Duct System Location or Area Served:
<i>Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.</i>

This installation certificate is required for compliance for alterations and additions in existing dwellings to space conditioning systems and duct systems.

Note: For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed. For a completely new or replacement duct system installed in an existing dwelling, use the Installation Certificate titled "Duct Leakage Test – Completely New or Replacement Duct System."

Duct Leakage Diagnostic Test – existing duct system

Select one compliance method from the following four choices. <input type="checkbox"/> Option 1. Measured leakage less than 15% of Fan Airflow. <input type="checkbox"/> Option 2. Measured leakage to outside less than 10% of Fan Airflow. <input type="checkbox"/> Option 3. Reduce leakage by 60% or more, and conduct smoke test to seal all accessible leaks. <input type="checkbox"/> Option 4. Fix all accessible leaks using smoke test, and HERS rater must verify. Note: (One of Options 1, 2, or 3 must be attempted before utilizing Option 4.)		
Determine nominal Fan Airflow using one of the following three calculation methods. <input type="checkbox"/> Cooling system method: Size of condenser in Tons _____ x 400 = _____ CFM <input type="checkbox"/> Heating system method: 21.7 x _____ Heating Output Capacity (kBtu/h) = _____ CFM <input type="checkbox"/> Measured system airflow using RA3.3 airflow test procedures: _____ CFM		
1	Option 1 used then: Allowed leakage = Fan Airflow _____ x 0.15 = _____ CFM Actual leakage = _____ CFM <div style="text-align: right;">Pass if Actual leakage is less than Allowed leakage</div>	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
2	Option 2 used then: Allowed leakage = Fan Airflow _____ x 0.10 = _____ CFM Actual leakage to outside = _____ CFM <div style="text-align: right;">Pass if Actual leakage to outside is less than Allowed leakage</div>	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
3	Option 3 used then: Initial leakage prior to start of work = _____ CFM Final leakage after sealing all accessible leaks using smoke test = _____ CFM Initial leakage _____ - Final leakage _____ = Leakage reduction _____ CFM (Leakage reduction _____ / Initial leakage _____) x 100% = % Reduction <div style="text-align: right;">Pass if % Reduction ≥ 60%</div>	<input type="checkbox"/> Pass <input type="checkbox"/> Fail
4	Option 4 used then: All accessible leaks repaired using smoke test. HERS rater must verify (No sampling). <div style="text-align: right;">Pass if all accessible leaks have been sealed using Smoke Test</div>	<input type="checkbox"/> Pass <input type="checkbox"/> Fail

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-21
Duct Leakage Test – Existing Duct System		(Page 2 of 2)
Site Address:	Enforcement Agency:	Permit Number:

- ☐ Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.
- ☐ All supply and return register boots must be sealed to the drywall if smoke test is utilized for compliance – applies to duct leakage compliance option 3 (leakage reduction by 60%) and option 4 (fix all accessible leaks) described above.
- ☐ New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.
- ☐ Mastic and draw bands must be used in combination with cloth backed rubber adhesive duct tape to seal leaks at all new duct connections.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-22
HSPP/PSPP Installation; Cooling Coil Airflow & Fan Watt Draw Test		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

Hole for the placement of a Static Pressure Probe (HSPP), and Permanently installed Static Pressure Probe (PSPP) in the supply plenum

When the Certificate of Compliance (CFIR) indicates Cooling Coil Airflow or Fan Watt Draw verification are required, HSPP or PSPP are required to be installed in each air handler in the dwelling. Procedures for installing HSPP and PSPP are described in Reference Residential Appendix RA3.3. This measure requires verification by a HERS rater.

Select one method from the two choices below for compliance with the HSPP/PSPP requirement for this dwelling.				
<input type="checkbox"/>	HSPP	1/4 inch (6 mm) hole labeled and located downstream of the evaporator coil in the supply plenum as shown in the figure in Section RA3.3.1.1.		
<input type="checkbox"/>	PSPP	1/4 inch (6 mm) hole equipped with a permanently installed pressure probe, labeled and located downstream of the evaporator coil in the supply plenum as shown in the figure in Section RA3.3.1.1.		
System Name or Identification/Tag				
System Location or Area Served				
Confirm that a HSPP or PSPP has been installed on the air handler per the requirements of RA3.3.1.1. Enter Pass or Fail				

Cooling Coil Airflow Verification

When the Certificate of Compliance indicates Cooling Coil Airflow verification is required, the procedures for measuring the cooling coil airflow must be performed as specified in Reference Residential Appendix RA3.3. Results of the cooling coil airflow diagnostic test must be entered in the table below. This measure requires verification by a HERS rater.

Select one method from the three choices below for compliance with the Cooling Coil Airflow test requirement for this dwelling.				
<input type="checkbox"/>	Diagnostic Fan Flow Using Plenum Pressure Matching according to the procedures in RA3.3.3.1.1			
<input type="checkbox"/>	Diagnostic Fan Flow Using Flow Grid Measurement according to the procedures in RA3.3.3.1.2			
<input type="checkbox"/>	Diagnostic Fan Flow Using Flow Capture Hood according to the procedures in RA3.3.3.1.3			
System Name or Identification/Tag				
System Location or Area Served				
Nominal Cooling Capacity (ton) of the outdoor unit.				
Enter the minimum airflow requirement from the CF-1R (CFM/ton).				
Calculate the target minimum airflow for the test by multiplying the CFM/ton criteria specified on the CF-1R by the nominal cooling capacity of the outdoor unit (ton). Target (CFM)				
Enter the diagnostically tested airflow (CFM). Tested (CFM)				
The system complies if Tested (CFM) is equal or greater than Target (CFM). Enter Pass or Fail				

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-22
HSPP/PSPP Installation; Cooling Coil Airflow & Fan Watt Draw Test		(Page 2 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Fan Watt Draw Verification

When the Certificate of Compliance indicates Fan Watt Draw verification is required, the procedures for measuring the Fan Watt Draw must be performed as specified in Reference Residential Appendix RA3.3. Results of the Fan Watt Draw diagnostic test must be entered in the table below. This measure requires verification by a HERS rater. Note: Fan watt draw must be measured simultaneously with cooling coil airflow. The fan watt draw measurement and cooling coil airflow measurement must simultaneously meet or exceed their target criteria specified by the CF-1R for the dwelling.

Select one method from the two choices below for compliance with the Fan Watt Draw test requirement for this dwelling.				
<input type="checkbox"/>	Portable Watt Meter Measurement according to the procedures in RA3.3.3.3.1			
<input type="checkbox"/>	Utility Revenue Meter Measurement according to the procedures in RA3.3.3.3.2			
System Name or Identification/Tag				
System Location or Area Served				
Enter the air handler Tested (CFM) from the cooling coil airflow test table above.				
Enter the fan watt draw requirement from the CF-1R (Watt/CFM).				
Calculate the target maximum Watt draw for the test by multiplying the Watt/CFM criteria specified on the CF-1R by the air handler Tested (CFM). Target (Watt)				
Enter the diagnostically tested Watt draw (Watt). Tested (Watt)				
The system complies if Tested (Watt) is less than or equal to Target (Watt) Enter pass or Fail				

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-23
Verification of High EER Equipment		(Page 1 of 1)
Site Address:	Enforcement Agency:	Permit Number:

Verification of High EER Equipment

Procedures for verification of High EER Equipment are described in Reference Residential Appendix RA3.4. For dwelling units with multiple systems, the procedures must be applied to each system separately. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

1	System Name or Identification/Tag				
2	System Location or Area Served				
3	Certified EER Rating of the installed equipment (Btu/Watt-hr)				
4	Make and Model Number of the installed Outdoor Unit				
5	Make and Model Number of the installed Inside Coil				
6	Make and Model Number of the installed Furnace or Air Handler.				
7	Minimum Equipment EER required for compliance as reported on the CF-1R				
<input type="checkbox"/> When a high EER system specification includes a time delay relay, the installation of the time delay relay must be verified for compliance credit. Refer to Reference Residential Appendix RA3.4.3 for the Time Delay Relay Verification Procedure. <input type="checkbox"/> When installation of specific matched equipment is necessary to achieve a high EER, installation of the specific equipment must be verified for compliance credit. Refer to Reference Residential Appendix RA3.4.3 for the Matched Equipment Verification Procedure.					
8	If the Certified EER Rating in row 3 is equal or greater than the required minimum EER in row 7, the unit complies. If the unit complies enter Pass				

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-24
Charge Indicator Display (CID)		(Page 1 of 1)
Site Address:	Enforcement Agency:	Permit Number:

CHARGE INDICATOR DISPLAY (CID)

Charge Indicator Display (CID) specifications are available in Reference Joint Appendix JA6; HERS verification procedure for the CID is in Reference Residential Appendix RA3.4.2. If refrigerant charge verification is required for compliance, and a CID has been installed on the system, a pass for this CID verification for an installed system is sufficient for demonstrating compliance with the refrigerant charge verification requirement for that system, thus submittal of a standard refrigerant charge verification compliance form (MECH 25) is not required for a system that has a passing CID verification shown in the table below.

CID - Verification of the Presence and Proper Function of a Charge Indicator Display

System Name or Identification/Tag						
System Location or Area Served						
CID Manufacturer Name and Model Number						
1	<input type="checkbox"/> Yes	<input type="checkbox"/> No	The display is mounted adjacent to the system thermostat			
2	<input type="checkbox"/> Yes	<input type="checkbox"/> No	The manufacturer has certified to the Energy Commission that the CID model meets the requirements of Reference Joint Appendix JA6.			
3	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Visual verification by the HERS rater confirms that the CID is installed on the system as specified in RA3.4.2.			
Yes to 1 and 2 and yes to either 3 or 4 is a pass			enter Pass or Fail		<input checked="" type="checkbox"/> Pass	<input checked="" type="checkbox"/> Fail

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-25
Refrigerant Charge Verification - Standard Measurement Procedure		(Page 1 of 5)
Site Address:	Enforcement Agency:	Permit Number:

Note: If installation of a Charge Indicator Display (CID) is utilized as an alternative to refrigerant charge verification for compliance, a MECH-24 Certificate (instead of this MECH-25 Certificate) should be used to demonstrate compliance with the refrigerant charge verification requirement. TMAH and STMS are not required for compliance, when a CID is utilized for compliance.

As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

Temperature Measurement Access Holes (TMAH) and Saturation Temperature Measurement Sensors (STMS)
Procedures for installing TMAH are specified in Reference Residential Appendix RA3.2. If refrigerant charge verification is required for compliance, TMAH are also required for compliance. STMS are only required for completely new or replacement space-conditioning systems that utilize prescriptive compliance method.

TMAH - Access Holes in Supply and Return Plenums of Air Handler

System Name or Identification/Tag					
System Location or Area Served					
1	<input type="checkbox"/> Yes	<input type="checkbox"/> No	5/16 inch (8 mm) access hole upstream of evaporative coil in the return plenum and labeled according to Figure in Section RA3.2.2.2.2.		
2	<input type="checkbox"/> Yes	<input type="checkbox"/> No	5/16 inch (8 mm) access hole downstream of evaporative coil in the supply plenum and labeled according to Figure in Section RA3.2.2.2.2.		
Yes to 1 and 2 is a pass.			Enter Pass or Fail	<input checked="" type="checkbox"/> Pass	<input checked="" type="checkbox"/> Fail

STMS - Sensor on the Evaporator Coil

System Name or Identification/Tag					
3	<input type="checkbox"/> Yes	<input type="checkbox"/> No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.		
4	<input type="checkbox"/> Yes	<input type="checkbox"/> No	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil		
5	<input type="checkbox"/> Yes	<input type="checkbox"/> No	When attached to a digital thermometer, the sensor provides an indication of the saturation temperature of the coil.		
Yes to 3, 4, and 5 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	<input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Pass

STMS - Sensor on the Condenser Coil

System Name or Identification/Tag					
6	<input type="checkbox"/> Yes	<input type="checkbox"/> No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.		
7	<input type="checkbox"/> Yes	<input type="checkbox"/> No	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil		
8	<input type="checkbox"/> Yes	<input type="checkbox"/> No	When attached to a digital thermometer, the sensor provides an indication of the saturation temperature of the coil.		
Yes to 6, 7, and 8 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	<input checked="" type="checkbox"/> N/A	<input checked="" type="checkbox"/> Pass

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-25
Refrigerant Charge Verification - Standard Measurement Procedure		(Page 2 of 5)
Site Address:	Enforcement Agency:	Permit Number:

Standard Charge Measurement Procedure (for use if outdoor air dry-bulb is above 55 °F)

Procedures for determining Refrigerant Charge using the Standard Charge Measurement Procedure are available in Reference Residential Appendix RA3.2. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

- *The system should be installed and charged in accordance with the manufacturer's specifications before starting this procedure.*
- *The system must meet minimum airflow requirements as prerequisite for a valid refrigerant charge test.*
- *If outdoor air dry-bulb is 55 °F or below, the installer must use the Alternate Charge Measurement Procedure.*

Space Conditioning Systems

System Name or Identification/Tag				
System Location or Area Served				
Outdoor Unit Serial #				
Outdoor Unit Make				
Outdoor Unit Model				
Nominal Cooling Capacity Btu/hr				
Date of Verification				

Calibration of Diagnostic Instruments

Date of Refrigerant Gauge Calibration	(must be re-calibrated monthly)
Date of Thermocouple Calibration	(must be re-calibrated monthly)

Measured Temperatures (°F)

System Name or Identification/Tag				
Supply (evaporator leaving) air dry-bulb temperature ($T_{\text{supply, db}}$)				
Return (evaporator entering) air dry-bulb temperature ($T_{\text{return, db}}$)				
Return (evaporator entering) air wet-bulb temperature ($T_{\text{return, wb}}$)				
Evaporator saturation temperature ($T_{\text{evaporator, sat}}$)				
Condensor saturation temperature ($T_{\text{condensor, sat}}$)				
Suction line temperature (T_{suction})				
Liquid Line Temperature (T_{liquid})				
Condenser (entering) air dry-bulb temperature ($T_{\text{condenser, db}}$)				

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-25
Refrigerant Charge Verification - Standard Measurement Procedure		(Page 3 of 5)
Site Address:	Enforcement Agency:	Permit Number:

Minimum Airflow Requirement

Temperature Split Method Calculations for determining Minimum Airflow Requirement for Refrigerant Charge Verification. The temperature split method is specified in Reference Residential Appendix RA3.2.				
System Name or Identification/Tag				
Calculate: Actual Temperature Split = $T_{\text{return, db}} - T_{\text{supply, db}}$				
Target Temperature Split from Table RA3.2-3 using $T_{\text{return, wb}}$ and $T_{\text{return, db}}$				
Calculate difference: Actual Temperature Split – Target Temperature Split =				
Passes if difference is between -4°F and +4°F or upon remeasurement, if between -4°F and -100°F Enter Pass or Fail				
<i>Note: Temperature Split Method Calculation is not necessary if actual Cooling Coil Airflow is verified using one of the airflow measurement procedures specified in Reference Residential Appendix RA3.3. If actual cooling coil airflow is measured, the value must be equal to or greater than the Calculated Minimum Airflow Requirement in the table below.</i>				
Calculated Minimum Airflow Requirement (CFM) = Nominal Cooling Capacity (ton) X 300 (cfm/ton)				
System Name or Identification/Tag				
Calculated Minimum Airflow Requirement (CFM)				
Measured Airflow using RA3.3 procedures (CFM)				
Passes if measured airflow is greater than or equal to the calculated minimum airflow requirement. Enter Pass or Fail				

Superheat Charge Method Calculations for Refrigerant Charge Verification. This procedure is required to be used for fixed orifice metering device systems				
System Name or Identification/Tag				
Calculate: Actual Superheat = $T_{\text{suction}} - T_{\text{evaporator, sat}}$				
Target Superheat from Table RA3.2-2 using $T_{\text{return, wb}}$ and $T_{\text{condenser, db}}$				
Calculate difference: Actual Superheat – Target Superheat =				
System passes if difference is between -6°F and +6°F Enter Pass or Fail				

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-25
Refrigerant Charge Verification - Standard Measurement Procedure		(Page 4 of 5)
Site Address:	Enforcement Agency:	Permit Number:

Subcooling Charge Method Calculations for Refrigerant Charge Verification. This procedure is required to be used for thermostatic expansion valve (TXV) and electronic expansion valve (EXV) systems.				
System Name or Identification/Tag				
Calculate: Actual Subcooling = $T_{\text{condenser, sat}} - T_{\text{liquid}}$				
Target Subcooling specified by manufacturer				
Calculate difference: Actual Subcooling – Target Subcooling =				
System passes if difference is between -4°F and +4°F Enter Pass or Fail				

Metering Device Calculations for Refrigerant Charge Verification. This procedure is required to be used for thermostatic expansion valve (TXV) and electronic expansion valve (EXV) systems.				
System Name or Identification/Tag				
Calculate: Actual Superheat = $T_{\text{suction}} - T_{\text{evaporator, sat}}$				
Enter allowable superheat range from manufacturer's specifications (or use range between 3°F and 26°F if manufacturer's specification is not available)				
System passes if actual superheat is within the allowable superheat range Enter Pass or Fail				

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-25
Refrigerant Charge Verification - Standard Measurement Procedure		(Page 5 of 5)
Site Address:	Enforcement Agency:	Permit Number:

Standard Charge Measurement Summary: System shall pass both refrigerant charge criteria, metering device criteria (if applicable), and minimum cooling coil airflow criteria based on measurements taken concurrently during system operation. If corrective actions were taken, all applicable verification criteria must be re-measured and/or recalculated.				
System Name or Identification/Tag				
System meets all refrigerant charge and airflow requirements. Enter Pass or Fail				

☐ Residential Appendix RA3.2.2 requires that if the outdoor temperature is between 55°F and 65°F the return air dry bulb temperature shall be maintained above 70°F during the Standard Charge Measurement Procedure. The signature of the Responsible Rater in the declaration statement below certifies this requirement has been met for all applicable system verifications reported on this certificate.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-27
Maximum Rated Total Cooling Capacity		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Maximum Rated Total Cooling Capacity (MRTCC) Compliance Credit

Procedures for calculating the Maximum Rated Total Cooling Capacity (MRTCC) compliance credit and Electrical Input exception are given in Reference Residential Appendix RA1. The value is calculated by the compliance software and given on the Certificate of Compliance (CF-1R). Compliance with this credit requires that the installed space conditioning system must have a cooling capacity rating at ARI conditions that is equal or less than the MRTCC compliance credit value. The system must also meet the HERS verification requirements for duct leakage, and prescriptive cooling coil airflow compliance credits, and if the Electrical Input Exception is utilized, the EER must be verified. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

1	System Name or Identification/Tag				
2	System Location or Area Served				
3a	ARI Rated Total Cooling Capacity of the installed system (Btu/hr)				
3b	Sum of the ARI Rated Total Cooling Capacities of multiple systems installed in the dwelling (Btu/hr), if applicable.				
Note: MRTCC credit may be calculated for the whole dwelling, or for individual cooling systems in the dwelling. If the MRTCC target value from the CF-1R is for the entire dwelling, and there are multiple cooling systems installed in the dwelling, then the sum of ARI Rated Cooling Capacities of the installed cooling systems must be calculated and entered in row 3b.					
4a	MRTCC target value from the CF-1R (Btu/hr) – if for individual systems				
4b	MRTCC target value from the CF-1R (Btu/hr) – if total for entire dwelling				
5	If the applicable row 3 value is less than or equal to the applicable row 4 value, the unit complies. If the unit complies enter Pass				

Electrical Input Exception for MRTCC compliance credit

Electrical Input Exception for MRTCC compliance credit allows the installed rated total cooling capacity to exceed the MRTCC target value for compliance credit if the electrical input of the oversized cooling system is less than or equal to the electrical input of a standard cooling system. For buildings with more than one cooling system, the proposed electrical input is the sum of the values for each system.

1	System Name or Identification/Tag				
2	System Location or Area Served				
6	ARI Rated EER of the installed unit (Btu/Watt-hr)				
7a	Calculate Proposed Electrical Input ⁷				
7b	Sum of the Proposed Electrical Input values for entire multiple systems installed in the dwelling (Watt), if applicable.				
8a	Calculate Standard Total Electric Input ⁸ (Watt) – if for individual systems				
8b	Calculate Standard Total Electric Input ⁸ (Watt) – if total for entire dwelling				
9	If the applicable row 7 value is less than or equal to the applicable row 8 value, the unit complies. If the unit complies enter Pass				

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-27
Maximum Rated Total Cooling Capacity		(Page 2 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Notes:

7) Proposed Electrical Input (Watt) = ARI Rated Total Cooling Capacity (Btu/hr) / ARI Rated EER (Btu/Watt-hr) if the proposed Air Conditioner is listed in the ARI database with a specified furnace or air handler and that furnace or air handler is to be installed.

Otherwise, if the proposed Air Conditioner is listed in the ARI database without a furnace or air handler, the proposed electrical input is either:

Proposed Electrical Input (Watt) = ARI Rated Total Cooling Capacity (Btu/hr) / ARI Rated EER (Btu/Watt-hr) + ARI Rated Total Cooling Capacity (Btu/hr) x .0048 (Watt-hr/Btu);

or

Proposed Electrical Input (Watt) = ARI Rated Total Cooling Capacity (Btu/hr) / ARI Rated EER (Btu/Watt-hr) - ARI Rated Total Cooling Capacity (Btu/hr) x .0122 (Watt-hr/Btu) + The measured fan power (Watt); where the measured fan power is determined at an airflow equal to or greater than 350 CFM per ton using the procedure described in RA3.3 of the Residential Appendices

8) Standard Total Electric Input (Watt) = MRTCC target from the CF-1R (Btu/hr) / 10 (Btu/Watt-hr)

- ☐ Systems must meet the Cooling Coil Airflow HERS verification requirement in order to receive credit for MRTCC.
- ☐ Systems must meet the Duct Sealing HERS verification requirements in order to receive credit for MRTCC.
- ☐ Systems must meet the HERS verification requirement for EER if the Electrical Input Exception is utilized to comply with the MTRCC compliance credit

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am the certified HERS rater who performed the verification services identified and reported on this certificate (responsible rater).
- The installed feature, material, component, or manufactured device requiring HERS verification that is identified on this certificate (the installation) complies with the applicable requirements in Reference Residential Appendices RA2 and RA3 and the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the local enforcement agency.
- The information reported on applicable sections of the Installation Certificate(s) (CF-6R), signed and submitted by the person(s) responsible for the installation conforms to the requirements specified on the Certificate(s) of Compliance (CF-1R) approved by the enforcement agency.

Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-28
Low Leakage Air Handler Verification		(Page 1 of 1)
Site Address:	Enforcement Agency:	Permit Number:

Verified Low Leakage Air Handler (LLAH) with Sealed and Tested Duct System *An additional compliance credit is available for verified low leakage ducts if a Low Leakage Air Handler is installed. The air handler must be connected to a Sealed and Tested New Duct System to receive the credit. Refer to Residential Appendix RA3.1.4.3.10. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.*

System Name or Identification/Tag				
System Location or Area Served				
LLAH Unit Make				
LLAH Unit Model				
<input type="checkbox"/> The LLAH must be connected to a New Duct System that meets the HERS verification requirement for Sealed and Tested Ducts in order to receive compliance credit. <input type="checkbox"/> The LLAH cabinet (furnace or heat pump fan and inside coil) must be certified to the Commission to leak 2 percent or less of its nominal air conditioning cfm delivered when pressurized to 1-inch water gauge with all present air inlets, air outlets, and condensate drain port(s) sealed.				
If the installed LLAH documentation confirms the unit meets the certification requirement and Duct Testing is specified on the CF-1R, the unit complies. If the unit complies enter Pass				

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- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
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Builder or Installer information as shown on the Installation Certificate (CF-6R)		
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:	CSLB License	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-29
Supply Duct Compliance Credits - Location; Surface Area; R-value		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Enter the Duct System Name or Identification/Tag:
Enter the Duct System Location or Area Served:
Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.

SUPPLY DUCT LOCATION COMPLIANCE CREDITS

Credit is available for supply duct systems entirely in conditioned space or with reduced surface area in unconditioned spaces.

☐ LESS THAN 12 LINEAR FEET OF SUPPLY DUCT OUTSIDE OF CONDITIONED SPACE COMPLIANCE CREDIT. *A detailed duct design is not required for compliance with this measure. HERS verification is required for compliance with this measure.*

<input type="checkbox"/> Yes	<input type="checkbox"/> No	Less than 12 linear feet of supply duct outside of conditioned space.
Yes to this compliance credit is a pass		✓ <input type="checkbox"/> Pass ✓ <input type="checkbox"/> Fail

☐ SUPPLY DUCTS LOCATED IN CONDITIONED SPACE COMPLIANCE CREDIT. *A detailed duct design is not required for compliance with this measure. HERS verification is required for compliance with this measure.*

<input type="checkbox"/> Yes	<input type="checkbox"/> No	Ducts are located within the conditioned volume of building.
Yes to this compliance credit is a pass		✓ <input type="checkbox"/> Pass ✓ <input type="checkbox"/> Fail

SUPPLY DUCT SURFACE AREA REDUCTION AND R-VALUE COMPLIANCE CREDITS

Credit is available for supply duct systems with reduced surface area in unconditioned space with varying combinations of higher performance insulation. In order to claim these credits a detailed duct system design is required to be documented on the plans approved by the enforcement agency, and the installation must be certified to be consistent with the approved plans by the installer, and the installation must be verified by a HERS rater. The size, R-value, and location of each duct segment in an unconditioned space including details describing if ducts are buried in attic insulation must be shown in the design drawings approved by the enforcement agency, entered into the compliance software, and shown on the CF-1R for the building. Procedures for field verification and diagnostic testing for this group of compliance credits are described in Reference Residential Appendix RA3.1

☐ SUPPLY DUCT SURFACE AREA REDUCTION COMPLIANCE CREDIT

<input type="checkbox"/> Yes	<input type="checkbox"/> No	Prescriptive Cooling Coil Airflow compliance has been verified.
<input type="checkbox"/> Yes	<input type="checkbox"/> No	The building's duct system design was approved by the enforcement agency, and the duct system design is detailed in the special features section of the CF-1R approved by the enforcement agency.
<input type="checkbox"/> Yes	<input type="checkbox"/> No	The installed duct system does not have severely twisted or compressed sections that would restrict required operating airflow.
<input type="checkbox"/> Yes	<input type="checkbox"/> No	The installed duct system layout, including duct sizes and locations of supply & return registers match the duct system design plans approved by the enforcement agency, and the installed duct system meets the requirements for Verified Duct Design specified in Reference Residential Appendix RA3.1.4.1.1.1
Yes to all is a pass		✓ <input type="checkbox"/> Pass ✓ <input type="checkbox"/> Fail

CERTIFICATE OF FIELD VERIFICATION AND DIAGNOSTIC TESTING		CF-4R-MECH-29
Supply Duct Compliance Credits - Location; Surface Area; R-value		(Page 2 of 2)
Site Address:	Enforcement Agency:	Permit Number:

❑ BURIED DUCTS ON THE CEILING R-VALUE COMPLIANCE CREDIT

In order to claim credit for buried ducts on the ceiling, the conditions for the Supply Duct Surface Area Reduction (above) must be met, the approved duct design must identify which portions of the duct system are "Buried", and the installed duct system must conform to the approved duct design. Also, the duct system must meet prescriptive Duct Leakage test requirements and the building must meet Quality Insulation Installation requirements.

<input type="checkbox"/> Yes	<input type="checkbox"/> No	The duct design passes the Supply Duct Surface Area Reduction compliance credit, buried ducts are shown on the approved duct design and on the approved CF-1R, and the installed duct system is consistent with the approved duct design drawings.
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Meets Verified Duct Leakage requirements
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Meets Verified Quality Insulation Installation requirements
		Yes to all is a pass <input checked="" type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail

❑ DEEPLY BURIED DUCTS R-VALUE COMPLIANCE CREDIT

In order to claim credit for buried ducts on the ceiling, the conditions for the Supply Duct Surface Area Reduction (above) must be met, the approved duct design must identify which portions of the duct system are "Deeply Buried", and the installed duct system must conform to the approved duct design. Also, the duct system must meet prescriptive Duct Leakage test requirements and the building must meet Quality Insulation Installation requirements.

<input type="checkbox"/> Yes	<input type="checkbox"/> No	The duct design passes the Supply Duct Surface Area Reduction compliance credit, buried ducts are shown on the approved duct design and on the approved CF-1R, and the installed duct system is consistent with the approved duct design drawings.
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Meets Verified Duct Leakage requirements
<input type="checkbox"/> Yes	<input type="checkbox"/> No	Meets Verified Quality Insulation Installation requirements
		Yes to all is a pass <input checked="" type="checkbox"/> Pass <input checked="" type="checkbox"/> Fail

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Responsible Person's Name:	CSLB License:	
HERS Provider Data Registry Information		
Sample Group # (if applicable):	<input type="checkbox"/> tested/verified dwelling	<input type="checkbox"/> not-tested/verified dwelling in a HERS sample group
HERS Rater Information		
HERS Rater Company Name:		
Responsible Rater's Name	Responsible Rater's Signature	
Responsible Rater's Certification Number w/ this HERS Provider:	Date Signed:	